

POECILOCHAETUS KOSHIKIENSIS, A NEW
POLYCHAETE SPECIES FROM
SHIMO-KOSHIKI ISLAND, JAPAN

Tomoyuki Miura

Abstract.—A new species of polychaetous annelid, *Poecilochaetus koshikiensis*, collected at a depth of 200 m off Shimo-Koshiki Island, Kyushu, southern Japan, is described. The new species is characterized by posterior notopodial hooks and basally fused anal cirri.

The genus *Poecilochaetus* Claparède, 1875 consists of 16 nominal species (Pilato & Cantone 1976, Read 1986). Their main diagnostic characters include the epidermal smoothness, the distribution of flask-shaped (ampullaceous) postsetal lobes (dorsal and ventral cirri), the length and number of nuchal organs, and the occurrence and distribution of several types of setae. Despite the small number of species and the large interspecific variability in morphology, some difficulties in the identification of species arise from the insufficient descriptions of most species, their intraspecific variability (Milligan & Gilbert 1984) and the confused terminology of the setae. For example, "plumose setae" called by Hartman (1939) corresponds to "pinnate setae" by Milligan & Gilbert (1984), while "plumose setae" by the latter refers to "spinose setae" by the former. In this study, the terminology of setae by Read (1986, Table 2) is chiefly followed. The worms are very fragile and complete specimens are rarely collected, even from shallow bottoms. The extensive morphology and habitat were described only on few particular species, such as *Poecilochaetus serpens* Claparède from England by Allen (1904), *P. australis* Nonato from Brazil by Nonato (1963), and *P. johnsoni* Hartman from Florida by Taylor (1966).

Only a single species, *Poecilochaetus japonicus* Kitamori, 1965, has been reported from Japanese coasts. In this study, a new

species of *Poecilochaetus* is described based on a complete female and two additional mature specimens collected in Japan. The types are deposited in the National Museum of Natural History, Smithsonian Institution (USNM), and the National Science Museum, Tokyo (NSMT).

The specimens were fixed in 10% formalin-seawater and preserved in 70% alcohol. Parapodia of the holotype were observed by a scanning electron microscope after dehydration in ethyl alcohol and critical drying in CO₂.

Family Poecilochaetidae Hannerz, 1956
Poecilochaetus Claparède, in
Ehlers, 1875
Poecilochaetus koshikiensis, new species
Figs. 1-3

Material.—Japan, off Shimo-Koshiki Island, Kagoshima Prefecture, 31°40.0'N, 129°40.7'E, 200 m, muddy sand, 4 Jun 1987, *Nansei-Maru* Cruise 1987-TR5, holotype, complete female (USNM 104126), paratype, incomplete male (USNM 104127), paratype, incomplete female (NSMT-Pol. P-249).

Types.—Holotype consisting of 68 setigers, 43 mm long, 1.5 mm wide without parapodia, 2.6 mm with parapodia. Mature types with gametes in coelom.

Description.—Prostomium small, rounded, with 2 pairs of eyes, anterior left eye

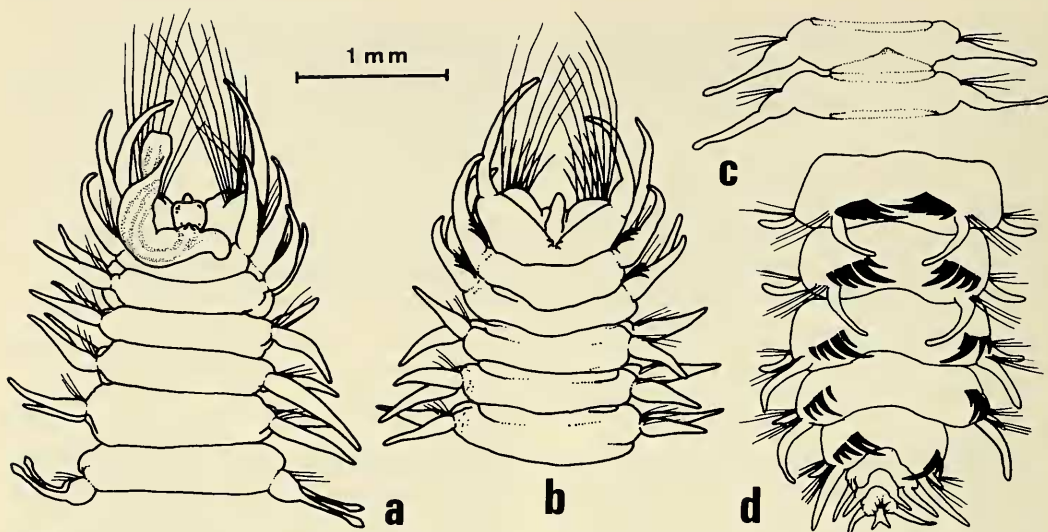


Fig. 1. *Poecilochaetus koshikiensis*, holotype: a, Anterior end, dorsal view; b, Same, ventral view; c, Dorsal view of setigers 9, with chitinized plate, and 10; d, Posterior end, dorsal view.

consisting of several pigment spots (in holotype, Fig. 1a). Nuchal organ trilobed, middle lobe extending posteriorly to setiger 4, flattened laterally with ciliated margin, lateral lobes small and discoid (Fig. 1a) and tentacular palps missing. Facial tubercle present in front of ventral mouth and directed anteriorly (Fig. 1b). Stout setae of setiger 1 directed forward, forming cephalic cage; parapodial postsetal lobes of anterior 3 setigers directed more or less forward (Fig. 1a, b). Weakly chitinized middorsal elevated plate present on setiger 9 (Fig. 1c). Pygidium with pair of cylindrical dorsal cirri and pair of short ventral cirri fused in single Y-shaped structure (Fig. 1d). Posterior segments well marked by stout notopodial spines.

Parapodia all biramous. First parapodium with very short notopodial and very long neuropodial postsetal lobes (Fig. 2a). Notopodial postsetal lobes longer than neuropodial ones on parapodia 2–6, both cylindrical (Fig. 2c). Notopodial postsetal lobes of setiger 5 longer than those of setigers 3, 4, and 6. Both postsetal lobes of parapodia 7–13 flask-shaped (ampullaceous) with swollen tips (Fig. 2d). Succeeding parapodia

on middle of body with long conical postsetal lobes (Fig. 2e, f). Far posterior postsetal lobes again cylindrical but smaller, notopodial ones with many conical tubercles (Fig. 2h, i). Numerous papillae present on anteroventral sides of anterior parapodia of setigers 1, 2, 6–8 (Fig. 2a, c, d). Interramal parapodial sensory organs present on all setigers except for setigers 6–9. A well-developed sensory organ cup-shaped with cilia in distal hole (Fig. 2b). Sensory organs varying in size and sometimes withdrawn and detected only by their cilia (Fig. 2g). Sensory organs of anterior 5 setigers well developed, those of others smaller. Branchiae absent.

First parapodium with stout cephalic setae forming cephalic cage, very long, surface covered with numerous short spines (Figs. 1a, b, 2a, 3c, d). Parapodia 2 and 3 with slender hispid capillaries, spiral setae (membranous capillary) and 3 or 4 neuropodial falcate spines (Fig. 2c). Falcate spines curved posteriorly to body axis, distal tip smooth in SEM observation, but finely hirsute in LM observation (Fig. 3a, b). Spiral setae with spirally fringed pectinate margin, present on all parapodia except for first setiger, their margins with long stout teeth on

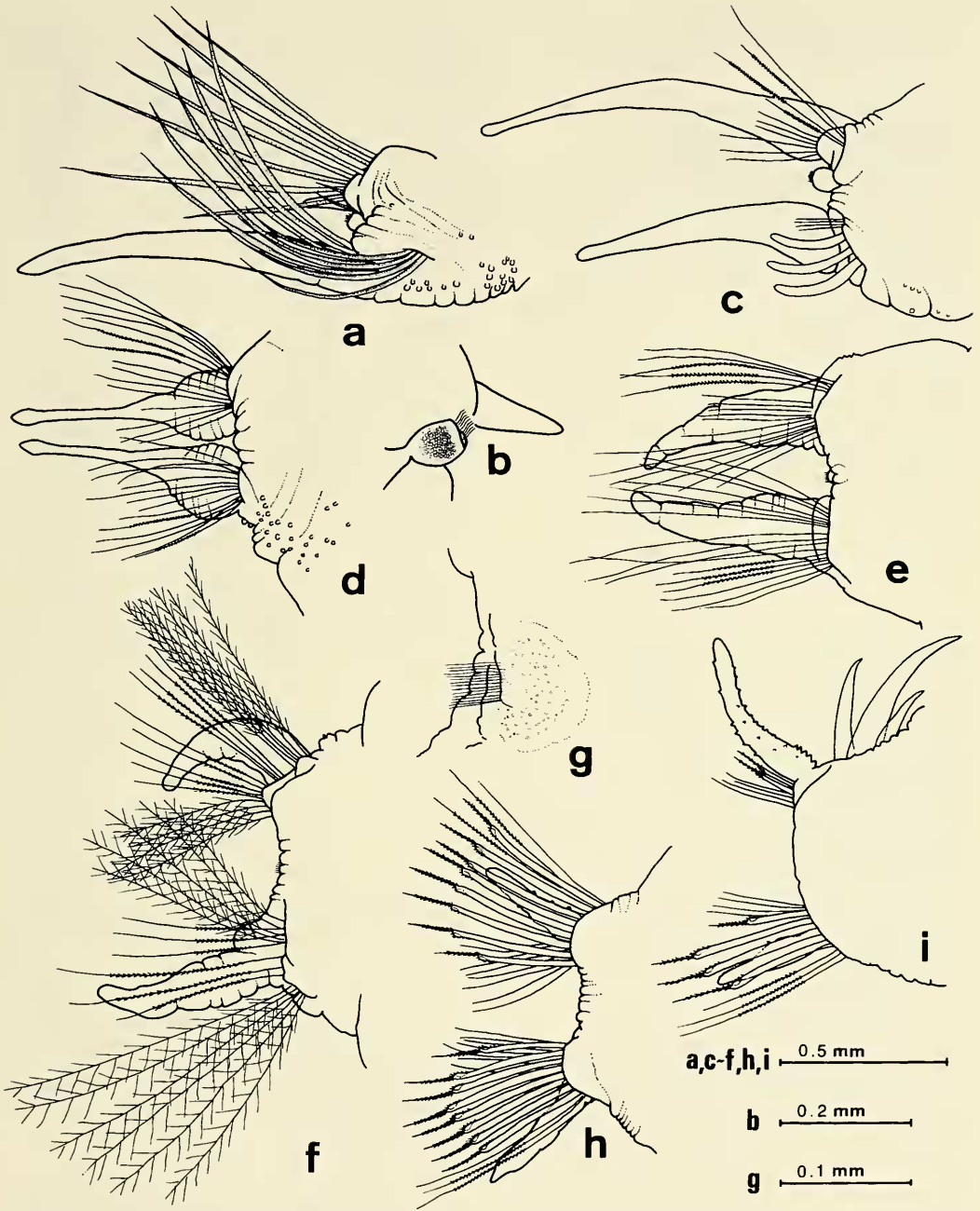


Fig. 2. *Poecilochaetus koshikiensis*: a, Parapodium 1, anterior view; b, Sensory organ below notopodial postsetal lobe of same; c, Parapodium 2; d, Parapodium 7; e, Parapodium 14; f, Parapodium 17; g, Sensory organ of same; h, Parapodium 54; i, Parapodium 61.

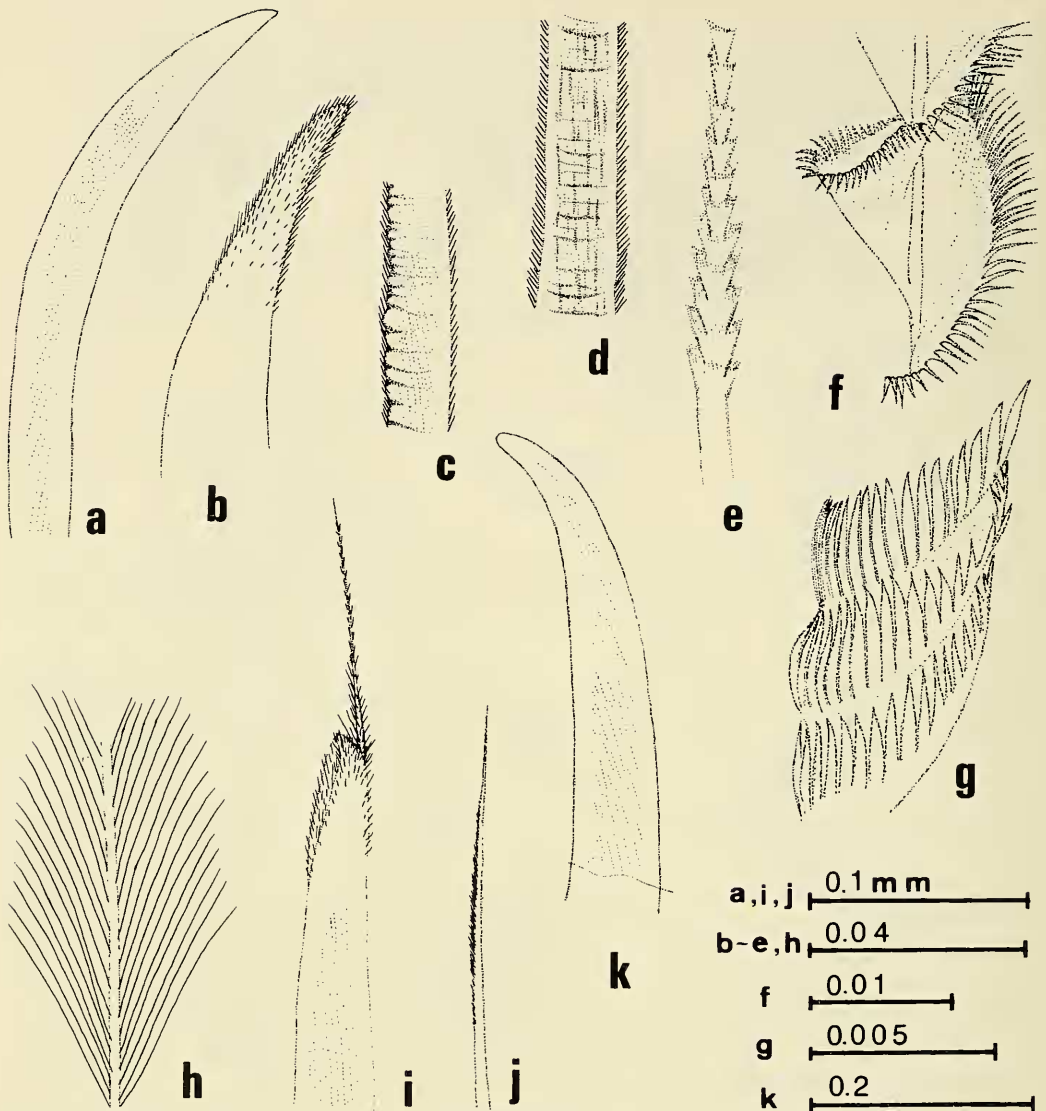


Fig. 3. *Poecilochaetus koshikiensis*: a, Neuropodial falcate spine from setiger 2; b, Enlarged tip of same; c, Section of cephalic seta from setiger 1 in lateral view; d, Same, convex side; e, Spiral seta; f, Distal part of same; g, Proximal part of same; h, Pappose seta; i, Aristate seta; j, Slender hispid seta; k, Posterior notopodial hook.

proximal part and fine teeth on distal part (Fig. 3e-g). Parapodia 4-16 with slender hispid capillaries and spiral setae (Fig. 2d, e). Parapodia 17-50 with pappose setae covered with long, fine flexible spinules on distal part and stout spinules on proximal part (Figs. 2f, 3h). Aristate setae first present on parapodia 48, unidentate with hoods

covered with numerous short spines (Figs. 2h, 3i). Posterior parapodia with slender hispid setae (Fig. 3j). Stout smooth notopodial hooks forming prominent dorsal shield in posterior 10 segments (Figs. 1d, 2i, 3k).

Remarks.—In the genus *Poecilochaetus*, seven species have flask-shaped cirri on

parapodia 7–13. Of these seven species, two species and a subspecies, *P. serpens* Allen, 1904, *P. serpens honiarae* Gibbs, 1971, and *P. tropicus* Okuda, 1935, 1937, have branchiae, differing easily from the abranchiate new species. *P. johnsoni* Hartman, 1939 and *P. australis* Nonato, 1963 differ from *P. koshikiensis* in lacking stout notopodial hooks which make remarkable dorsal shields of several preanal segments in the new species. *P. fauchaldi* Pilato & Cantone, 1976 differs from the new species in lacking aristate spines and interramal sensory organs on segments posterior to setiger 5. *P. paratropicus* Gallardo, 1968 has well-developed lateral lobes on the nuchal organ, while *P. koshikiensis* has only small discoidal ones. *P. japonicus* Kitamori, 1965, the only species recorded from Japan, and known only from anterior fragments, has a very short middle lobe on the nuchal organ, reaching setiger 2, compared to the new species with middle lobe extending back to setiger 4.

Etymology.—The species name is derived from the type locality, Shimo-Koshiki Island.

Literature Cited

- Allen, E. J. 1904. The anatomy of *Poecilochaetus* Claparède.—Quarterly Journal of Microscopical Science, N.S. London 48:79–151, 1 fig., 6 pls.
- Ehlers, E. 1875. Beiträge zur Kenntnis der Verticalverbreitung der Borstenwürmer im Meere.—Zeitschrift für Wissenschaftliche Zoologie, Leipzig 25:1–102, 4 pls.
- Gallardo, V. A. 1968. Polychaeta from the Bay of Nha Trang, South Viet Nam. Scientific Results of Marine Investigations of the South China Sea and the Gulf of Thailand 1959–1961.—Naga Report 4(3):35–279, 59 pls.
- Gibbs, P. 1971. The polychaete fauna of the Solomon Islands.—Bulletin of the British Museum (Natural History), Zoology, London 21(5):99–211, 17 figs.
- Hannerz, L. 1956. Larval development of the polychaete families Spionidae Sars, Disomidae Mesnil, and Poecilochaetidae n. fam. in Gullmar Fjord (Sweden).—Zoologiska Bidrag från Uppsala 31:1–204, 57 figs.
- Hartman, O. 1939. New species of polychaetous annelids from southern California.—Allan Hancock Pacific Expedition 7(2):157–172, 2 pls.
- Kitamori, R. 1965. Two new species of rare families, Disomidae and Paralacydonidae (Annelida: Polychaeta).—Bulletin of Tokai Regional Fisheries Research Laboratory (44):41–44, 2 figs.
- Milligan, M. R., & K. M. Gilbert. 1984. Chapter 9, Poecilochaetidae. Pp. 1–7 in J. M. Uebelacker & P. G. Johnson, eds., Taxonomic guide to the polychaetes of the northern Gulf of Mexico, Volume 2. Barry A. Vittor and Associates, Mobile, Alabama.
- Nonato, E. 1963. *Poecilochaetus australis* n. sp. (Annelida, Polychaeta).—Neotropica 9(28):17–26, 15 figs.
- Okuda, S. 1935. *Poecilochaetus tropicus* n. sp., a remarkable sedentary polychaete from the South Seas.—Proceedings of the Imperial Academy of Japan 11:289–291, 2 figs.
- . 1937. Polychaetous annelids from the Palau Islands and adjacent waters, the South Sea Islands.—Bulletin of the Biogeographical Society of Japan 7(12):257–315, 59 figs.
- Pilato, G., & G. Cantone. 1976. Nuove specie de *Poecilochaetus* e considerazioni sulla famiglia dei Poecilochaetidae (Annelida, Polychaeta).—Animalia, Catania 3(1/3):29–63.
- Read, C. B. 1986. New deep-sea Poecilochaetidae (Polychaeta: Spionida) from New Zealand.—Journal of Natural History 20(2):399–414, 36 figs.
- Taylor, J. L. 1966. A Pacific polychaete in Southeastern United States.—Quarterly Journal of the Florida Academy of Sciences 29(1):21–26.

Faculty of Fisheries, Kagoshima University, 4-50-20 Shimoarata, Kagoshima, 890 Japan.